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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/762,656

01/22/2004

John S. Wheat

8540P-000185

5141

27572

7590

04/28/2006

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EXAMINER

CHUO, TONY SHENG HSIANG

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 04/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/762,656

Applicant(s)

WHEAT ET AL.

Examiner

Tony Chuo

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/12/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-10, 12-24, 27-35, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Dickman et al (US 2001/0049038). Regarding claims 1-2, 8-9, 13-14, 16-20, 23, 31, 33, 35, and 38, the Dickman reference teaches a fuel cell system and method of controlling power to a load supplied by a plurality of fuel cells comprising: a plurality of fuel cell stacks "76" connected in parallel and supplying a gross current to a load "80"; a plurality of inputs to and a plurality of output from the stacks; a contactor "100" between the stacks and the load; a current sensor "126" that senses a current generated by one or more of the stacks "76" where the controller uses sensed current to determine the gross load current which is proportional to the total rated power output; and a controller that produces a desired current which is proportional to the maximum desired power output of the device through the load from at least one stack by adjusting, based on the gross load current, parameters affecting the anode input and cathode input (See Figure 10, paragraphs [0035],[0047],[0057],[0061]). In addition, it also teaches a stack assembly "77" comprising individual stacks "76" that collectively have a total rated power output that equals the maximum desired power output of the device (See paragraph [0042]). Therefore, the currents produced by the individual

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stacks are balanced according to the total rated power output of the stack assembly. Further, the balancing is performed by adjusting the flow of hydrogen gas, air and/or cooling fluid to the stacks (See paragraph [0061]). Regarding claims 3, 15, and 22, it also teaches controlling an input from the fuel cell stack comprising controlling temperature, pressure, flow rate, composition, state of actuation, load, etc (See paragraph [0057]). Regarding claims 4 and 21, it also teaches a plurality of fuel cell stacks where each stack contains one or more fuel cells (See paragraph [0033]). Regarding claim 5, it also teaches each fuel cell stack that has a maximum rated power output that is at least as great as the maximum desired power output (See claim 9). Therefore, the controller can produce a desired current through just one of the stacks. Regarding claim 6, it also teaches that each stack may operate independent of the other stacks so the controller controls a first current through the first stack and a second current through a second stack where the second current is controlled independently of the first current (See paragraph [0034]). Regarding claims 7 and 34, it is well known in the art that the current of the stack is proportional to the size of the active areas of the stack. Therefore, if the active areas of the stacks are known, then the controller would control the first and second currents based on the set points proportional to active areas of first and second stacks. Regarding claim 10 and 27, it also teaches determining the gross load current or total rated power output and adjusting the air flow to one or more of the stacks to meet the total rate power output (See paragraph [0061]). Therefore, the gross cathode stream mass flow rate would be determined by summing the air flows to each of the stacks. Regarding claim 12 and 30, it also teaches that for loads less than

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the maximum, only that number of fuel cells necessary to meet the load demand are brought online and operational (See paragraph [0046]). Therefore, the total power necessary to meet the load demand is adjusted by adjusting the number of parallel stacks. Regarding claims 24, it teaches controlling the input to a given stack by adjusting the flow of hydrogen gas, air, and/or cooling fluid to that stack (See paragraph [0061]). The input flows to the stack are adjusted based upon determining the stack load current and the desired current through the given stack. Regarding claim 28, it also teaches interrupting the flow of hydrogen and air to a given stack so that the stack does not produce electric current (See paragraph [0061]). Regarding claim 29, it teaches controlling the input such as flow rate to one or more of the stacks to control a plurality of currents through the plurality of stacks (See paragraph [0061]). Regarding claim 32, as a result of controlling the input such as flow rate, a desired set point for current is obtained.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 11, 25-26, 36-37, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickman et al (US 2001/0049038) in view of Boehm et al (US 6461751). The Dickman reference is applied to claims 1-10, 12-24, 27-35, and 38 for

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reasons stated above. However, the reference does not expressly teach using oxygen sensors in the cathode inlet and outlet to determine oxygen consumption and using the determined oxygen consumption to determine gross load current. The Boehm reference teaches determining the amount of oxygen consumed by the fuel cell to generate an electric current by controlling the oxidant stream mass flow rate and measuring the oxygen concentration from sensors in the cathode inlet and outlet (See column 12, line 50 to column 13, line 16). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Dickman fuel cell system to determine the gross load current by using the determined oxygen consumption in order to improve overall efficiency of a fuel cell system by reducing parasitic power consumption.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

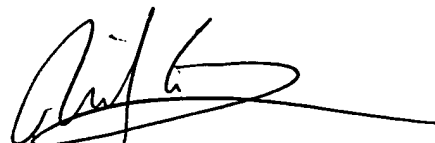
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TK 4/26/06

A handwritten signature in black ink, appearing to read 'Michael Barr', with a long horizontal flourish extending to the right.

MICHAEL BARR
SUPERVISORY PATENT EXAMINER